College Trigonometry PRACTICE TEST #1 (5.1 – 5.4) Name: Solutions
Mrs. Robertson Test is Feb. 3-4 Homework is due Feb. 4 class time.

No graphing devices of any kind allowed on this test. All answers are **exact** unless noted otherwise.
Show work where work is required on the test. **Please** circle all answers.

PART 1

1. Find the degree measure of the least positive angle that is coterminal with -1740°.

$\beta = \alpha + 360°K$
$-1740° = \alpha + 360°(-5)$
$-1740° = \alpha - 1800°$
$60° = \alpha$

2. Convert 23° 27' 32" to decimal degrees. Round to 3 decimal places is necessary.

$23 + \frac{27}{60} + \frac{32}{3600} = 23.458888\overline{8}$

$\approx 23.459°$

3. Convert 51.74° to degrees, minutes and seconds.

$.74 \times 60 = 44.4$ min
$.4 \times 60 = 24$ sec.

$51°44'24''$

4. Convert 105° to radian measure.

$105° \times \frac{\pi}{180°} = \frac{7\pi}{12}$

5. Change $\frac{10\pi}{3}$ to degree measure.

$\frac{10\pi}{3} \times \frac{180}{\pi} = 600°$

6. Find the **exact** length of the arc intercepted by a central angle of 135° in a circle with diameter of 10 feet.

$s = \alpha r$ α = central angle in radians r = radius = $\frac{1}{2}$ diameter

$135° = \frac{3\pi}{4}$ $r = 5$ feet $s = \frac{3\pi}{4} \cdot 5$ ft

$s = \frac{15\pi}{4}$ ft

7. Find the **exact value** of $\sin(\alpha)$ if $\cos(\alpha) = \frac{1}{4}$ and α is in quadrant I.

$\sin^2\alpha + \cos^2\alpha = 1$
$\sin^2\alpha + \left(\frac{1}{4}\right)^2 = 1$
$\sin^2\alpha = 1 - \frac{1}{16}$
$\sin^2\alpha = \frac{15}{16}$
$\sin\alpha = \sqrt{\frac{15}{16}}$

$\sin\alpha = \frac{\sqrt{15}}{4}$

$y = 3\sin[2(x - \pi/2)] + 3$

8. Determine the following for: $y = 3\sin(2x - \pi) + 3$

a.) amplitude = 3

b.) period = π

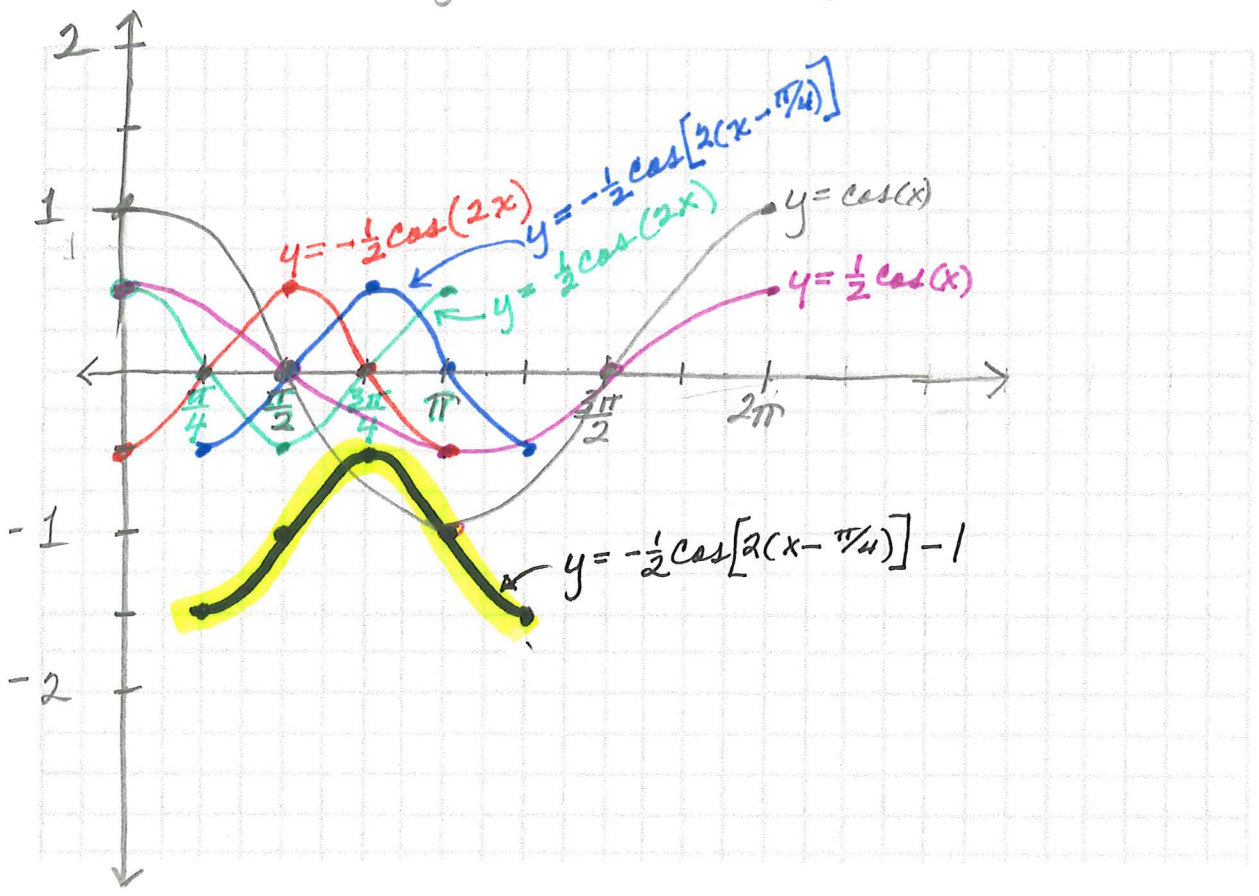
c.) phase shift = right $\frac{\pi}{2}$
(Indicate Left or Right.)

d.) vertical shift = up 3
(Indicate Up or Down.)

e.) range = $[0, 6]$

9. (a) Sketch one cycle of $y = -\frac{1}{2}\cos\left(2x - \frac{\pi}{2}\right) - 1$. Include the sketch of the parent function and each transformation. You may use a hi-lighter to indicate your final graph. Be sure to indicate the units on the x- and y- axes.

$y = -\frac{1}{2}\cos[2(x - \pi/4)] - 1$



(b) List the **coordinates** of the **5 key points** (as ordered pairs) of the sketch of part (a) of your final graph.

$\left(\frac{\pi}{4}, -\frac{3}{2}\right), \left(\frac{\pi}{2}, -1\right) \left(\frac{3\pi}{4}, -\frac{1}{2}\right) \left(\pi, -1\right) \left(\frac{5\pi}{4}, -\frac{3}{2}\right)$

PART 2 Name: _____

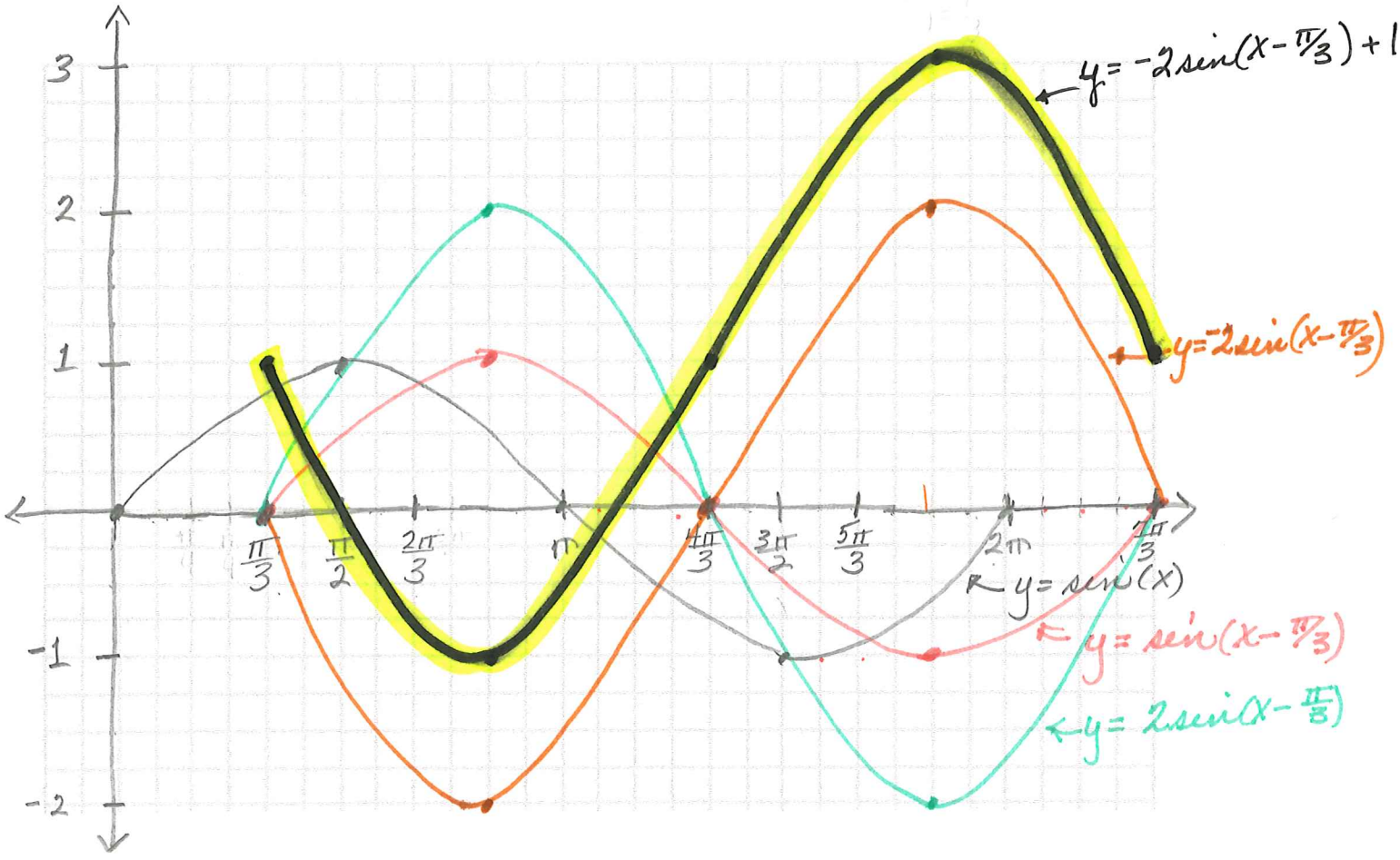
10. What is the **frequency** of the sine wave determined by: $y = \sec(525\pi x)$ where x is the time in minutes?

period $= \frac{2\pi}{525\pi} = \frac{2}{525}$ frequency $= \frac{525}{2} =$ 262.5 cycles/min

11. (a) If y = sin(x) is shifted $\frac{\pi}{3}$ units to the right, reflected in the x-axis, vertically stretched by 2, and shifted 1 unit up, then what is the equation of the curve in its final position?

$y = -2\sin(x - \pi/3) + 1$

(b) **Sketch** one cycle of this function on graph paper provided. **Label units on x and y axis.** Include the sketch of the parent function and each transformation. You may hi-light your final graph.

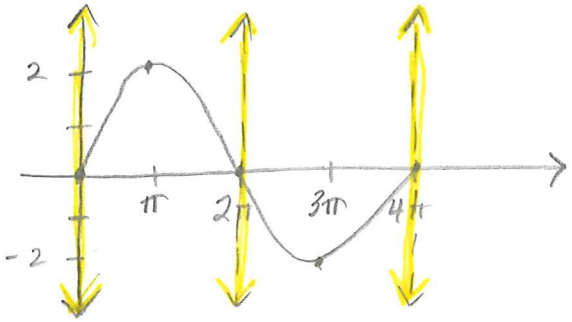


12. What is the period for $y = -3\tan\left(\frac{1}{2}x\right) + 2$?

period $= \frac{\pi}{B} = \frac{\pi}{\frac{1}{2}} =$ 2π

$y = 2\sin\left(\frac{1}{2}x\right)$ period $= \frac{2\pi}{1/2} = 4\pi$

13. Find the equations of all asymptotes for $y = 2\csc\left(\frac{1}{2}x\right)$ in the interval $[0, 4\pi]$.

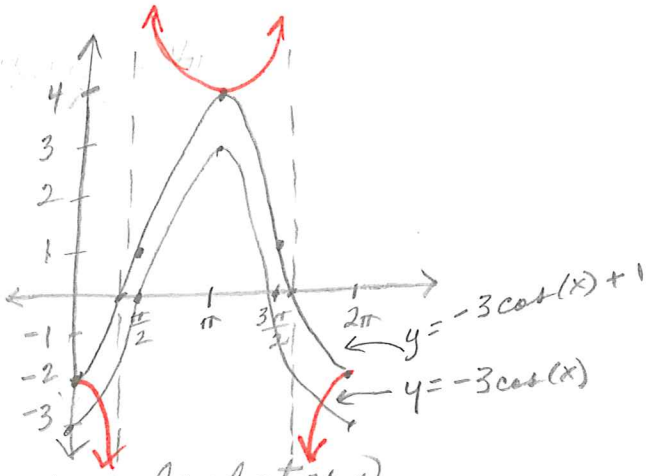


$x = 0$
$x = 2\pi$
$x = 4\pi$

14. What is the range of $y = -3\sec\left(\frac{1}{2}x\right) + 1$?

cos $[-2, 4]$

sec $(-\infty, -2] \cup [4, \infty)$



Find the **exact** value of: Show your work - no calculators.

15. $\tan\left(\frac{4\pi}{3}\right)$ $\quad \frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} = \boxed{\sqrt{3}}$

16. $\cot\left(\frac{-2\pi}{3}\right)$ $\quad \frac{\cos x}{\sin x} = \frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}} =$

$\frac{1}{\sqrt{3}} = \boxed{\sqrt{3}}$

17. $\csc\left(\frac{7\pi}{4}\right)$

$\sin\left(\frac{7\pi}{4}\right) = -\frac{1}{2}$

$\csc\left(\frac{7\pi}{4}\right) = \boxed{-2}$

18. $\sec\left(\frac{5\pi}{6}\right)$

$\cos\left(\frac{5\pi}{6}\right) = -\frac{\sqrt{3}}{2}$

$\sec\left(\frac{5\pi}{6}\right) = -\frac{2}{\sqrt{3}} = \boxed{-\frac{2\sqrt{3}}{3}}$